UC864-E/G/WD/WDU Product Description

UC864-E/G/WD/WDU
80281ST10034a Rev. 4 - 2009-06.24



Making machines talk.

APPLICABILITY TABLE

PRODUCT	P/N
UC864-E	4990250031
UC864-G	4990250030
UC864-WDU	4990250050
UC864-WD	4990250051



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1 Introduction

1.1 Scope

Scope of this document is to provide an overview of the technical aspects to consider while implementing audio functionalities onto applications integrating Telit modules specified in the aforementioned Applicability Table.

1.2 Audience

This document is intended for customers who are evaluating the UC864 modules.

1.3 Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit's Technical Support Center (TTSC) at:

TS-EMEA@telit.com
TS-NORTHAMERICA@telit.com
TS-LATINAMERICA@telit.com
TS-APAC@telit.com

Alternatively, use:
http://www.telit.com/en/products/technical-support-center/contact.php
For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:
http://www.telit.com
To register for product news and announcements or for product questions contact Telit's Technical Support Center (TTSC).
Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.
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1.4 Document Organization

This document contains the following chapters:

Chapter 1: "Introduction" provides a scope for this document, target audience, contact and support information, and text conventions.

Chapter 2: "Overview" gives an overview of the features of the product.

Chapter 3: "General product Description" describes in details the characteristics of the product, providing information such as operating frequencies, mechanical dimensions and interfaces specifics.

Chapter 4: "Evaluation Kit" provides a brief description of the Telit Evaluation Kit (EVK2) as far as these modules are concerned.

Chapter 5: "Software Features" describes in details concepts involved in the software equipped on the modules.

Chapter 6: "AT Commands" provides specification of the AT commands supported by the modules.

Chapter 7: "Conformity Assessment Issues" provides some fundamental hints about the conformity assessment that the final application might need.

Chapter 8: "Safety Recommendation" provides some safety recommendations that must be followed by the customer in the design of applications that makes use of the modules.

1.5 Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.



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1.6 Related Documents

The following is a list of applicable documents downloadable from the Download zone's section of Telit's website http://www.telit.com

- UC864-E/G/WD/WDU Hardware User Guide, 1vv0300766a
- UC864-E/G/WD/WDU Software User Guide, 1vv0300767
- Easy GPRS User Guide, 80000ST10028
- AT Commands Reference Guide, 80304ST10041a
- Telit EVK2 User Guide, 1vv0300704



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1.7 Document History

Revision	Date [yyyy-mm-dd]	Changes
0 Draft	2007-11-07	Initial issue
1	2008-08-08	general revision of the document
2	2009-01-08	updated 2.1 Dimensions updated 2.8 GPS features(only for UC864-G) updated 2.8.2 GPS consumption updated 2.9 Supply voltage updated 2.10 WCDMA/GSM Power consumption updated 2.13.1 Reset signal updated 2.15.1 ADC Converter updated 2.15.2 DAC Converter updated 2.16 Mounting the UC864-E/G on your board updated 2.17 Packing system updated 13 Conformity Assessment Issues Added §6 with: UC864-E RoHS compliance, UC864-G RoHS compliance, UC864-E declaration of conformity UC864-G declaration of conformity UC864-E R&TTE NBO opinion UC864-G R&TTE NBO opinion UC864-G FCC Equipment Authorization UC864-G IC Equipment Authorization Updated UC864-G drawing Updated 2.8 with GPS characteristics Updated 2.7.3 for RF connectors identification
3	2009-01-29	Added 1.1 UC864-E/G/WD/WDU Product Specification table Added UC864-WD/WDU characteristics
4	2009-06-24	Added UC864-G GCF compliance declaration Applied new layout, shifted chapter numbers accordingly Added RoHS certificate for UC864-WD and UC864-WDU Added Premium FOTA Management (PFM), Telit Over-The-Air firmware updating service description



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2 Overview

The **Telit UC864-E/G/WD/WDU** modules are small, lightweight, low power consumption and RoHS compliant devices that allow digital communication services wherever a WCDMA, HSDPA (HSDPA for UC864-E/G only), GSM, GPRS and EGPRS network is present.

Telit UC864-E/G supports HSDPA 7.2. UC864-G is three band HSDPA7.2 (850/1900/2100 MHz) and quad band GSM (GSM 850/900, DCS 1800 and PCS 1900) with the addition of a 12-channel GPS receiver integrated onboard. UC864-E is one band HSDPA7.2 (2100 MHz) and quad band GSM (GSM 850/900, DCS 1800 and PCS 1900).

UC864-WD/WDU is a low cost solution for medium to high quantity projects, when high data rate typical of HSDPA are not required, downlink speed is 384kb max. UC864WD is dual band UMTS in 900/2100 MHz and dual band GSM in GSM 900 and DCS 1800. UC864-WDU is dual band UMTS in 850/1900 MHz and dual band GSM in GSM 850 and PCS 1900.

UC864-E/G/WD/WDU benefits of Telit Unified Form Factor concept, a product family pin-to-pin compatible, sharing the same SW interface.

The **UC864-E/G/WD/WDU** is provided with an 80-pin Molex board to board connector and a 50 Ohm Murata RF connector for GSM/WCDMA antenna on front side. The UC864-G is also provided with an additional 50 Ohm Murata RF connector for GPS antenna on the rear side.

The **UC864-E/G/WD/WDU** module includes features like GPRS/EDGE CLASS 12, Voice, Circuit Switched Data transfer, Fax, Phonebook and SMS support, embedded TCP/IP stack and battery charging capabilities.
UC864-G is also provided with integrated full 12-channel high sensitivity GPS functionality for indoor fixes and simultaneous GPS with voice & data.



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The **UC864-E/G/WD/WDU** is specifically designed and developed by **Telit** for OEM usage and dedicated to portable data, voice and telemetric applications such as:

- **Telemetry and Telecontrol (SCADA applications)**
- **Security systems**
- **Automated Meter Reading (AMR)**
- **Vending machines**
- **POS terminals**
- **PDAs and Mobile Computing**
- **Phones and Payphones**
- **Automotive and Fleet Management applications**
- **Battery powered applications needing a battery charger**
- **Return channel for digital broadcasting**
- **Position reporting and tracking with integrated GPS (UC864-G only)**

The UC864-E/G/WD/WDU supports the following functionalities

- **EASY GPRS (AT driven embedded TCP/IP protocol stack)**
- **EASY SCAN (full GSM frequency scanning)**

From the interface point of view, the **UC864-E/G/WD/WDU** provides the following:

- **USB2.0 for AT commands**
  - **Baud rate up to 12 Mbps**
- **Full RS232 UART, CMOS level (ASC0) interface for AT commands:**
  - **Fixed baud rate up to 230 Kbps**
- **SIM card interface, 1.8 / 3 volts with auto-detection and hot insertion**
- **22 x GPIO ports (max)**
- **3 x A/D converters**
- **1 x D/A converter**
- **1 x buzzer output**
- **1 x single led supply output**

In order to meet the competitive OEM and vertical market stringent requirements, Telit supports its customers with a dedicated Support Policy with:

- **Telit Evaluation Kit EVK2** to help you develop your application;
- A Website with all updated information available;
- An high level specialist technical support to assist you in your development;

For more updated information concerning product Roadmap, availability, technical characteristics, commercial and other issues, please check on the Telit website www.telit.com > Products (UMTS/HSDPA) > UC864 Family.



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NOTE:

Some of the performances of the **Telit modules** depend on SW version installed on the module itself.
The **Telit modules** SW group is continuously working in order to add new features and improve the overall performances.
The **Telit modules** are easily upgradeable by the developer using the **Telit** Flash Programmer.



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2.1 UC864 Product Specification

ITEM	FEATURE			
	UC864-E	**UC864-G**	**UC864-WD**	**UC864-WDU**
Air interface	▪ Single-Band UMTS/HSDPA 2100MHz ▪ Quad-Band GSM 850/900/1800/1900	▪ Tri-band UMTS/HSDPA 2100/1900/850 ▪ Quad-Band GSM 850/900/1800/1900 ▪ Standalone GPS	▪ Dual-band UMTS/WEGDE 2100 /900 ▪ Dual-Band GSM 900/1800	▪ Dual-band UMTS/WEDGE 1900 /850 ▪ Dual-Band GSM 850/1900
Data Service	HSDPA UL 384kbps, DL 7.2Mbps WCDMA UL/DL 384kbps, EDGE UL/DL 236.8Kbps, GPRS UL/DL 85.6 Kbps, CSD 9.6Kbps		WCDMA UL/DL 384kbps, EDGE UL/DL 236.8Kbps, GPRS UL/DL 85.6 Kbps, CSD 9.6Kbps	
Size	36.2(l)x30(w)x4.8(t)	45(l)x30(w)x4.8(t)		
Interface	USB 2.0(AT command etc), 80 Pin Board to Board connector, SIM/RF connector			
Antenna	External Antenna			
Memory	64MB SDRAM and 64MB Flash memory			
Voice	▪ Vocoder - GSM(FR/EFR/AMR) and UMTS(Static/Dynamic AMR) ▪ Supplementary Service			
Message	SMS (MO/MT)			
SIM Card	Support 1.8 and 3V UICC			
Security	▪ GPRS - Ciphering(GEA1/GEA2), Encryption(A5/1, A5/2), Authentication(PAP/CHAP) ▪ UMTS - Encryption(UEA1), integrity UIA ▪ IMEI Security, SIM lock			
Internet Protocols	▪ TCP/IP, UDP/IP, PPP protocol, V42Bis data compression			
Applications	▪ SVD(Simultaneous Voice and Data) ▪ SIM PBM(Phone Book Management) ▪ FOTA ▪ FDN dialing number ▪ Service dialing number ▪ Enhanced operator name string			

NOTE:
In the following sections, UC864 family refers to all UC864 products mentioned in the **table above.** Whenever a command and/or feature is referred to a specific model, it is clearly highlighted.



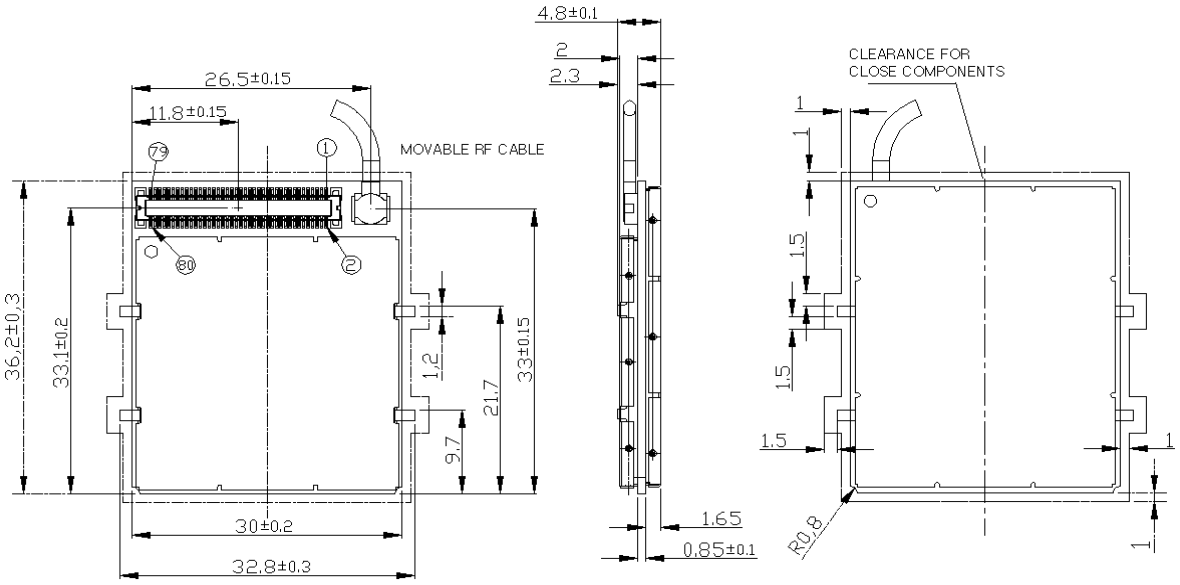
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3 General Product Description

3.1 Dimensions

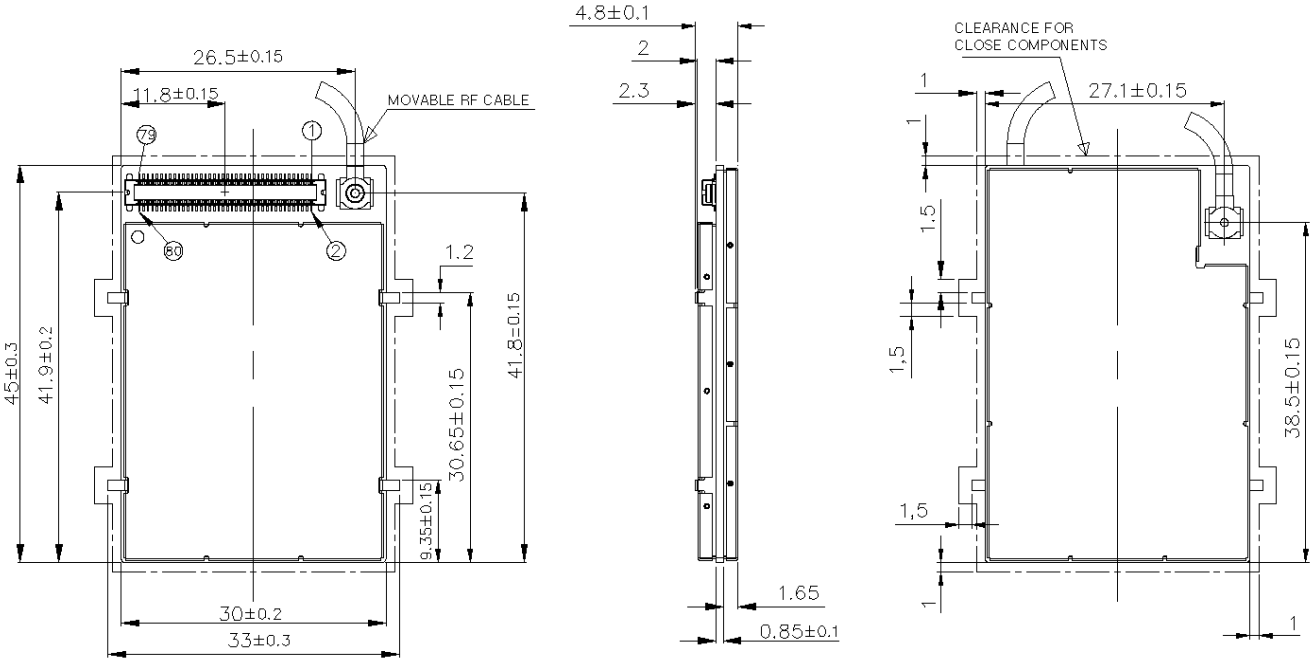
Dimensions	UC864-E	UC864-G/WD/WDU
Length(mm)	36.2	45
Width(mm)	30	30
Thickness(mm)	4.8	4.8

UC864-E drawing

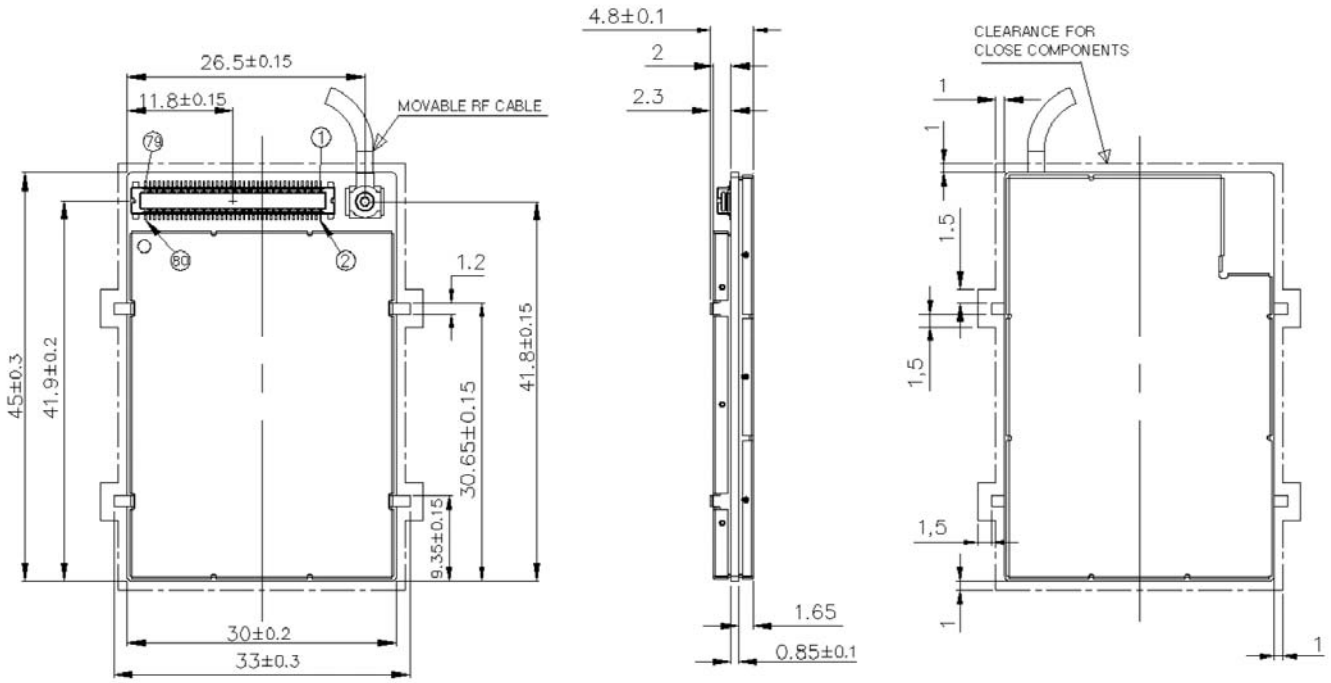


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UC864-G drawing



UC864-WD/WDU drawing





3.2 Weight

Weight	
UC684-E	10 gr.
UC864-G/WD/WDU	12.8 gr.

3.3 Environmental requirements

The **Telit UC864 family** module is compliant with the applicable 3gpp reference documentation TS 25.101 Release 2004-03.

3.3.1 Temperature range

	UC864 family	Note
Operating temperature	-20 ~ +55°C	The module is functional in all the temperature range, and it fully meets the ETSI specifications.
	-30 ~ +80°C	The module is functional in all the temperature range. Temperatures outside the range –20°C ÷ +55°C, might slightly deviate from ETSI specifications.
Temperature in not functional conditions[1]	-40 ~ +85°C	

Vibration Test (non functional)

- 10 ~12Hz ASD = 1.92m 2 /s 3
- 12 ~ 150Hz –3dB/oct

3.3.2 RoHS compliance

As a part of Telit corporate policy regarding environmental protection, the **UC864 family** complies with the RoHS (Restriction of Hazardous Substances) directive of the European Union (EU Directive 2002/95/EG).

[1] Functional: the module is able to make and receive voice calls, data calls, SMS and make data traffic.



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3.4 Operating Frequency

The operating frequencies in WCDMA/HSDPA (HSDPA for UC864-E/G only), GSM850, EGSM900, DCS, PCS modes are conform to the WCDMA and 3gpp specifications.

Mode	Freq. TX (MHz)	Freq. RX (MHz)	Channels (ARFC)	TX – RX offset	Note
WCDMA-850	826.4-846.6	871.4-891.6	Tx : 4132-4233 Rx : 4357-4458	45MHz	For UC864-G/WDU
WCDMA-900	882.4-912.6	927.4.-957.6	Tx : 2712-2863 Rx : 2937-3088	45MHz	For UC864-WD
WCDMA-1900	1852.4-1907.6	1932.4-1987.6	Tx : 9262-9538 Rx : 9662-9938	80MHz	For UC864-G/WDU
WCDMA-2100	1922.4-1977.6	2112.4-2167.6	Tx : 9612-9888 Rx : 9662-9938	80MHz	For UC864-E/G/WD
GSM-850	824.2-848.8	869.2-893.8	128-251	45 MHz	For UC864-E/G/WDU
E-GSM-900	890.0 - 914.8	935.0 - 959.8	0 – 124	45 MHz	For UC864-E/G/WD
	880.2 - 889.8	925.2 - 934.8	975 - 1023	45 MHz	
DCS-1800	1710.2 - 1784.8	1805.2 - 1879.8	512 – 885	95 MHz	For UC864-E/G/WD
PCS-1900	1850.2 - 1909.8	1930.2 - 1989.8	512 - 810	80 MHz	For UC864-E/G/WDU

3.5 Transmitter output power

WCDMA850/900/1900/2100
The **Telit UC864 family** transceiver modules in WCDMA-850/900/1900/2100 (2100 MHz for UC864-E/G/WD, 850 and 1900 MHz for UC864-G/WDU and 900 MHz only for UC864-WD) operating mode are **class 3** in accordance with the specifications which determine the nominal 0.25W peak RF power (+24dBm) on 50 Ohm.

GSM850/900(GSM/GPRS mode)
The **Telit UC864 family** transceiver modules in GSM850/900 (850, 900 MHz for UC864-E/G, 850 MHz only for UC864-WDU and 900 MHz only for UC864-WD) operating mode are **class 4** in accordance with the specifications which determine the nominal 2W peak RF power (+33dBm) on 50 Ohm.

GSM850/900(EGPRS mode)
The **Telit UC864 family** transceiver modules in GSM850/900(850 ,900 MHz for UC864-E/G, 850 MHz only for UC864-WDU and 900 MHz only for UC864-WD) operating mode are **class E2** in accordance with the specifications which determine the nominal 0.5W peak RF power (+27dBm) on 50 Ohm.



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DCS1800/PCS1900(GSM/GPRS mode)
The **Telit UC864 family** transceiver modules in DCS1800/PCS1900 (1800 ,1900 MHz for UC864-E/G, 1900 MHz only for UC864-WDU and 1800 MHz only for UC864-WD) operating mode are **class 1** in accordance with the specifications which determine the nominal 1W peak RF power (+30dBm) on 50 Ohm.

DCS1800/PCS1900(EGPRS mode)
The **Telit UC864 family** transceiver modules in DCS1800/PCS1900(1800 ,1900 MHz for UC864-E/G, 1900 MHz only for UC864-WDU and 1800 MHz only for UC864-WD) operating mode are **class E2** in accordance with the specifications which determine the nominal 0.4W peak RF power (+26dBm) on 50 Ohm.

3.6 Reference sensitivity

WCDMA850/900/1900/2100
The sensitivity of the **Telit UC864 family** modules according to the specifications for the class 3 portable terminals WCDMA850/900/1900/2100 (2100 MHz for UC864-E/G/WD, 850 and 1900 MHz for UC864-G/WDU and 900 MHz only for UC864-WD) is **–108.2 dBm** typical in normal operating conditions.

GSM850/900
The sensitivity of the **Telit UC864 family** modules according to the specifications for the class 4 GSM850/900 (850, 900 MHz for UC864-E/G, 850 MHz only for UC864-WDU and 900 MHz only for UC864-WD) portable terminals is **–107 dBm** typical in normal operating conditions.

DCS1800/PCS1900
The sensitivity of the **Telit UC864 family** modules according to the specifications for the class 1 portable terminals DCS1800/PCS1900 (1800 ,1900 MHz for UC864-E/G, 1900 MHz only for UC864-WDU and 1800 MHz only for UC864-WD) is **–106 dBm** typical in normal operating conditions.



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3.7 Antennas

3.7.1 GSM/WCDMA Antenna

The antenna that the customer chooses to use should fulfill the following requirements:

Frequency range	Depending by frequency band(s) provided by the network operator, the customer shall use the most suitable antenna for that/those band(s)
Bandwidth	70 MHz in GSM850, 80 MHz in GSM900, 170 MHz in DCS & 140 MHz PCS 70 MHZ in WCDMA850, 80 MHz in WCDMA900, 140 MHz in WCDMA1900 & 250 MHz in WCDMA2100 band

For further information, please refer to the UC864-E/G/WD/WDU Hardware User Guide.

3.7.2 GPS Antenna (only for UC864-G)

The active GPS antenna should fulfill the following requirements:

Frequency range	1575.42 MHz(GPS L1 band)
Bandwidth	+/- 2 MHz

The supply voltage to the active GPS antenna is provided by the UC864-G.
For further information, please refer to the UC864-E/G/WD/WDU Hardware User Guide.

3.7.3 UC864 Antenna connectors

3.7.3.1 GSM/WCDMA Applications

The **UC864 family** module is equipped with a 50 Ohm RF connector from Murata, GSC type P/N **MM9329-2700B,** located on the front side next to the 80-pin Molex. The suitable counterpart is Murata **MXTK92** Type or **MXTK88** Type.

3.7.3.2 GPS Applications (only for UC864-G)

The **UC864-G** module is equipped with an additional 50 Ohm RF connector from Murata, GSC type P/N **MM9329-2700B,** located on the rear side. The suitable counterpart is Murata **MXTK92** Type or **MXTK88** Type.



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3.8 GPS Features (only for UC864-G)

The **UC864-G** has an integrated 12 channels, low consumption & high sensitive, GPS receiver.
GPS receiver works in standalone mode, but the handset is ready to implement, if requested, also the Qualcomm gpsOne functionality (A-GPS: Assisted-GPS) that supports standalone GPS in real-time location in urban area and wherever a high sensitivity acquisition is needed.
This enables a wide variety of location-based services and applications, including points of interest, personal navigation, and friend finder.
In standalone mode, the handset demodulates the data directly from the GPS satellites and it requires no server interaction and works out of network coverage.

As main features of such GPS receiver, we can mention:

- Simultaneous GPS and Voice/Data
- High sensitivity for indoor reception, up to -157dBm (with active antenna)
- Extremely fast TTFF's at low signal levels
- Supports 12-Channel GPS L1 1575.42 MHz
- Accuracy: 3m (CEP68: 68% Circular Error Probable)
- GPS NMEA 0183 output format
- Date WGS-84
- Dedicated GPS AT commands
- Low power consumption



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3.8.1 GPS Sensitivity*

Time to first fix	
Hot start	Autonomous < 1s
Warm start	Autonomous < 32s
Cold start	Autonomous < 40s
Sensitivity	
Tracking	Up to -157 dBm

*** NOTE:**

Performance will vary depending on environment, antenna type, signal conditions, satellite geometry, and handset implementation.

3.8.2 GPS Consumption*

The typical current consumption of the GPS part of the **UC864-G module** is:

UC864-G			
Mode		Average(mA)	Mode description
IDLE mode with GPS ON full power mode			Stand by mode; no call in progress; GPS ON
AT+CFUN=1	WCDMA	117	
	GSM	113	
AT+CFUN=4	WCDMA	109	
	GSM	109	

***NOTE**:

Except external active GPS antenna.

3.8.3 GPS Driving

The GPS functions are driven from the Base Band processor trough a dedicated AT command set available in a separate specification.



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3.8.4 GPS NMEA

The GPS data stream (NMEA 0183 format) is also available on the pin-out in USB data format.

3.8.5 NMEA sentences

The following GPS sentences are available:

GGA - Global positioning system fix data (provides 3D location and accuracy data)

VTG – Course over ground and ground speed

GSA - GPS DOP and active satellites

RMC - Recommended Minimum Specific GPS Data

GLL - Geographic Latitude and Longitude

3.9 Supply voltage

The external power supply must be connected to VBATT signal and must fulfill the following requirements:

Nominal operating voltage	3.8 V
Operating voltage range	3.4 V – 4.2 V

WARNING:

Operating voltage range must never be exceeded; care must be taken in order to fulfill min/max voltage requirements.



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3.10 WCDMA/GSM Power consumption

The typical current consumption of the **Telit UC864 family** is:

Power off current (typical)	< 26 μA;
Stand–by current (WCDMA Idle)	< 22mA (<4.1mA using command AT+CFUN=5)
Stand–by current (GSM Idle)	< 15.0mA (<3.3mA using command AT+CFUN=5)
Operating current in WCDMA voice channel	< 690 mA @ worst network conditions
Operating current in GSM voice channel	< 317 mA @ worst network conditions
Operating current in WCDMA data channel	< 680 mA @ worst network conditions
Operating current in HSDPA channel (HSDPA for UC864-E/G only)	< 730 mA @ worst network conditions
Operating current in GPRS Class 12	< 790 mA @ worst network conditions
Operating current in EGPRS Class 12	< 560 mA @ worst network conditions



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3.11 Embodied Battery charger

The battery charger is suited for 3.7V Li-Ion rechargeable battery (suggested capacity 500-1000mAH). The Charger needs only a CURRENT LIMITED power source input and charges the battery directly through VBATT connector pins.

Battery charger input pin	CHARGE
Battery pins	VBATT, GND
Battery charger input voltage min	5.0 V
Battery charger input voltage typ	5.5 V
Battery charger input voltage max	7.0 V
Battery charger input current max	400mA
Battery type	Li-Ion rechargeable

WARNING:

If embodied battery charger is used, then a LOW ESR capacitor of at least 100µF must be mounted in parallel to VBATT pin.

WARNING:

When power is supplied to the CHARGE pin, a battery must always be connected to the VBATT pin of the UC864 family.



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3.12 User Interface

The user interface is managed by AT commands specified on the ITU-T V.250, 3gpp 27.007 and 27.005 specifications.

3.12.1 Speech Coding

The **UC864 family** voice codec support the following rates:

- WCDMA
  - Adaptive Multi Rate
- GSM
  - Half Rate
  - Full rate
  - Enhanced Full Rate
  - Adaptive Multi Rate

3.12.2 SIM Reader

The **UC864 family** supports R5 and R99 3gpp TS 31.114 - USIM 1.8V and 3V ONLY with an external SIM connector. For 5V SIM operation an external level translator can be added.

3.12.3 SMS

The **UC864 family** supports the following SMS types:

- Mobile Terminated (MT) class 0 – 3 with signaling of new incoming SMS, SIM full, SMS read
- Mobile Originated class 0 – 3 with writing, memorize in SIM and sending
- Cell Broadcast compatible with CB DRX with signaling of new incoming SMS.

3.12.4 Real Time Clock and Alarm

The **UC864 family** supports the Real Time Clock and Alarm functions through AT commands, furthermore an alarm output pin (GPIO6) can be configured to indicate the alarm with a hardware line output.
Furthermore the Voltage Output of the RTC power supply is provided so that a backup capacitor can be added to increase the RTC autonomy.



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3.12.5 Data/fax Transmission

The **UC864 family** supports:

- WCDMA/HSDPA category 8, MS Class A Simultaneous Voice and Data (HSDPA for UC864-E/G only)
- EGPRS/GPRS CLASS 12, MS Class B
- CSD up to 14.4 Kbps
- Fax service, Class 1 Group 3.

3.12.6 Local security management

The local security management can be done with the lock of Universal Subscriber Identity module (USIM), and security code request at power–up.

3.12.7 Call control

The call cost control function is supported.

3.12.8 Phonebook

This function allows the storing of the telephone numbers in SIM memory. The capability depends on SIM version and embedded memory.

3.12.9 Characters management

The **UC864 family** supports the IRA characters set (International Reference Alphabet), in TEXT and PDU mode.

3.12.10 SIM related functions

Activation and deactivation of the numbers stored in phone book FDN, ADN and PINs are supported. Extension at the PIN2 for the PUK2 insertion capability for lock condition is supported.

3.12.11 Call status indication

The call status indication by AT commands is supported.



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3.12.12 Automatic answer (Voice, Data or FAX)

After a specified number of rings, the module will automatically answer with a beep. The user can set the number of rings by means of the command ATS0=<n>.

3.12.13 Supplementary services (SS)

The following supplementary services are supported:

- Call Barring,
- Call Forwarding,
- Calling Line Identification Presentation (CLIP),
- Calling Line Identification Restriction (CLIR),
- Call Waiting, other party call Waiting Indication,
- Call Hold, other party Hold / Retrieved Indication,
- Closed User Group supplementary service (CUG),
- Advice of Charge,
- Unstructured SS Mobile Originated (MO)

3.12.14 Acoustic signaling

The acoustic signaling of the **UC864 family** on the selected acoustic device are the following:

- Call waiting;
- Ringing tone;
- SMS received tone;
- Busy tone;
- Power on/off tone;
- Off Hook dial tone;
- Congestion tone;
- Connected tone;
- Call dropped;
- No service tone;
- Alarm tone.



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3.12.15 Buzzer output

The General Purpose I/O pin GPIO7 can be configured to output the BUZZER output signal, with only an external MOSFET/transistor and a diode a Buzzer can be directly driven.
The ringing tone and the other signaling tones can be redirected to this Buzzer output with a specific AT command.

3.12.16 RF Transmission Monitor

As alternate function of the GPIO5, the **UC864 family** provides the RF transmission monitor. When the alternate function is activated, the pin of GPIO5 changes to HIGH every time the module transmits an RF signal and remains HIGH for the duration of the transmission sequence.

3.13 Logic level specifications

Where not specifically stated, all the interface circuits work at 2.6V CMOS logic levels. To get more detailed information about the logic level specifications used in the **UC864 family** interface circuits please consult the **UC864-E/G/WD/WDU** Hardware User Guide.

3.13.1 Reset signal

Signal	Function	I/O	UC864 family pin
RESET	Phone reset	I/O	54

RESET is used to reset the **UC864 family.** Whenever this signal is pulled low; the **UC864 family** is reset. When the device is reset it stops any operation and after the release of the reset it is unconditionally rebooted, without doing any detach operation from the network where it is registered to. This behavior is not like a proper shut down because any device is requested to issue a detach request on turn off. For this reason, the Reset signal must not be used to normally shutting down the device, but only as an emergency exit in the rare case the device remains stuck waiting for some network response.
The RESET is internally controlled on start-up to achieve always a proper power-on reset sequence, so there's no need to control this pin on start-up. It may only be used to reset a device already on that is not responding to any command.



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NOTE:

Do not use this signal to power off the **Telit UC864 family module**. Use the ON_OFF signal to perform this function or the AT#SHDN command. (To turn off UC864-E, first of all, you MUST cut off supplying power to the USB_VBUS, or the module does not turn off).



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3.14 Audio levels specifications

The audio of the **UC864 family** is organized into two main paths:

- internal path (called also MT)
- external path (called also HF)

These two paths are meant respectively for handset and headset/hands-free use. The **UC864 family** has a built in echo canceller and a noise suppressor, tuned separately for the two audio paths; for the internal path the echo canceller parameters are suited to cancel the echo generated by a handset, while for the external audio path they are suited for a hands-free use.
For more information on the audio, refer to the **UC864-E/G/WD/WDU** Hardware User Guide.



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3.15 Converters

3.15.1 ADC Converter

The on board ADCs are 8-bit converter. They are able to read a voltage level in the range of 0 - 2 volts applied on the ADC pin input, store and convert it into 8 bit word.

	Min	Max	Units
Input Voltage range	0	2,0	Volt
AD conversion	-	8	bits
Resolution	-	< 10.2	mV

3.15.2 DAC Converter

The on board DAC is a 16-bit converter, able to generate an analogue value based on a specific input in the range from 0 up to 65535 but recalibrated in the range from 0 to 1023. However, an external low-pass filter is necessary. See the HW User Guide for the details.

	Min	Max	Units
Voltage range (filtered)	0	2,6	Volt
Range	0	1023	Steps

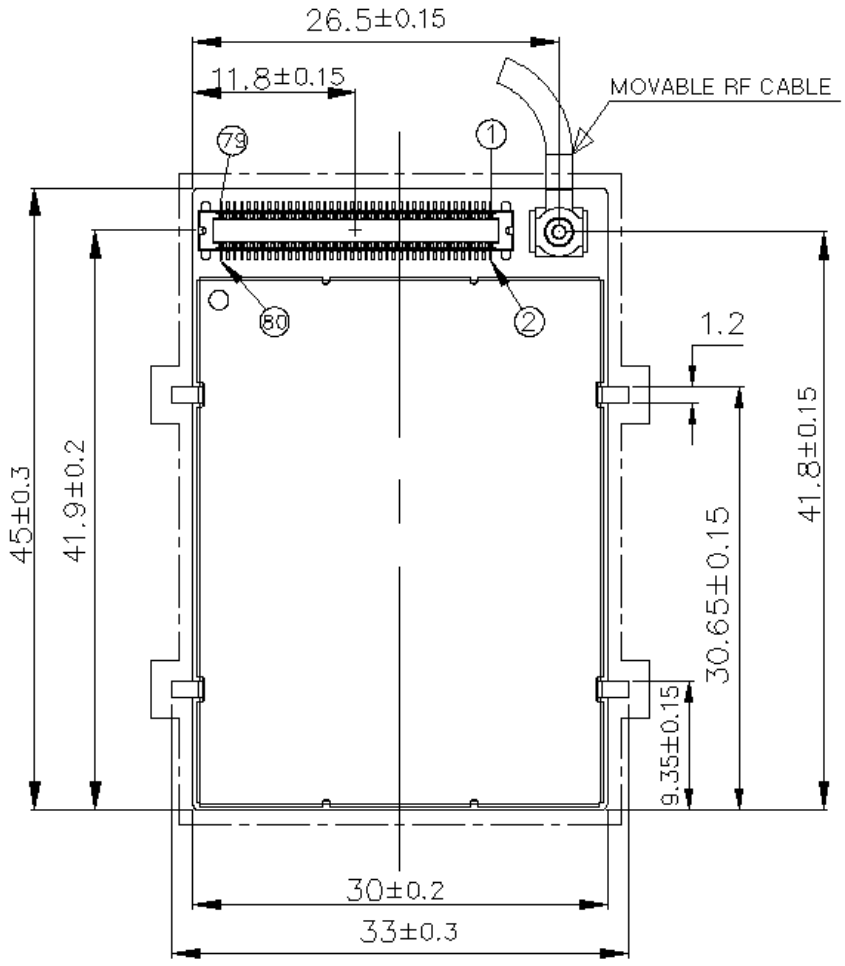


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3.16 Mounting UC864 on your board

3.16.1 UC864-G/WD/WDU

The position of the Molex board to board connector and the pin 1 are shown in the following picture.

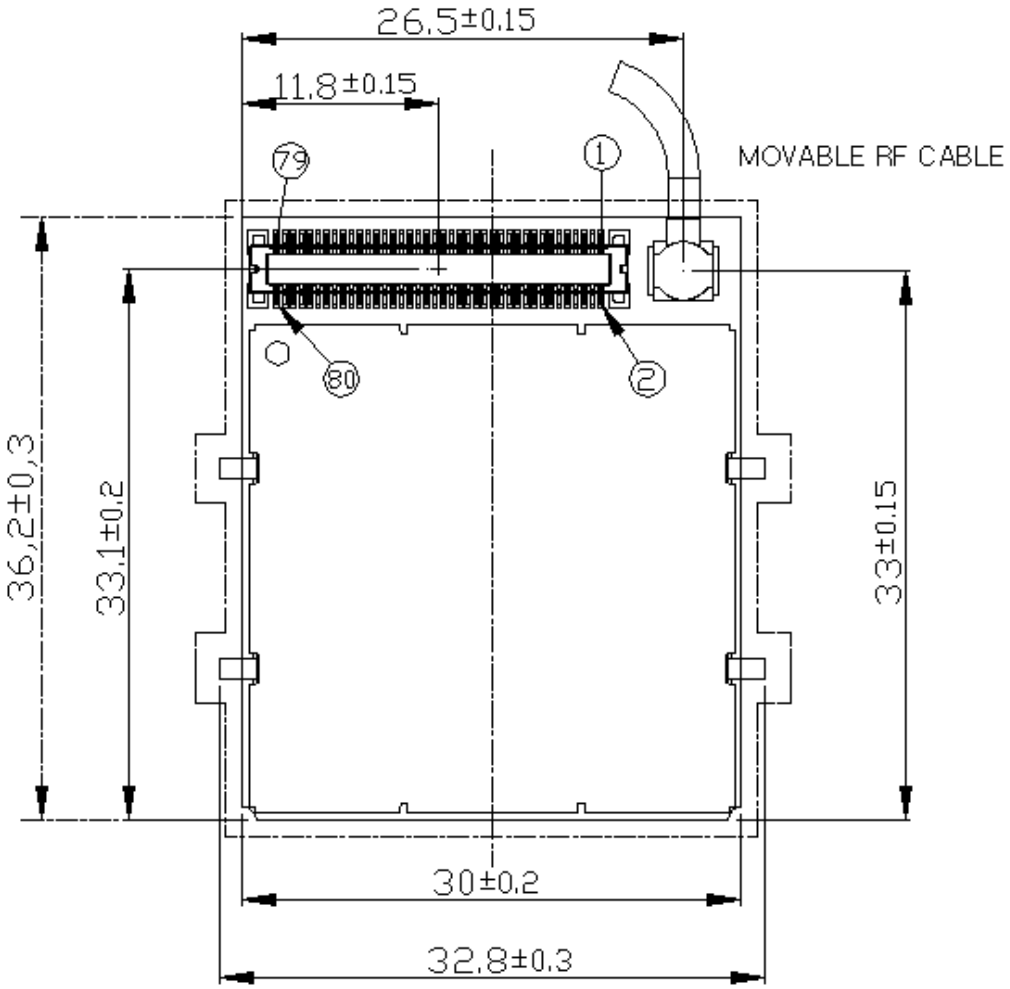


NOTE:

Metal tabs present on UC864-G/WD/WDU should be connected to GND

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3.16.2 UC864-E

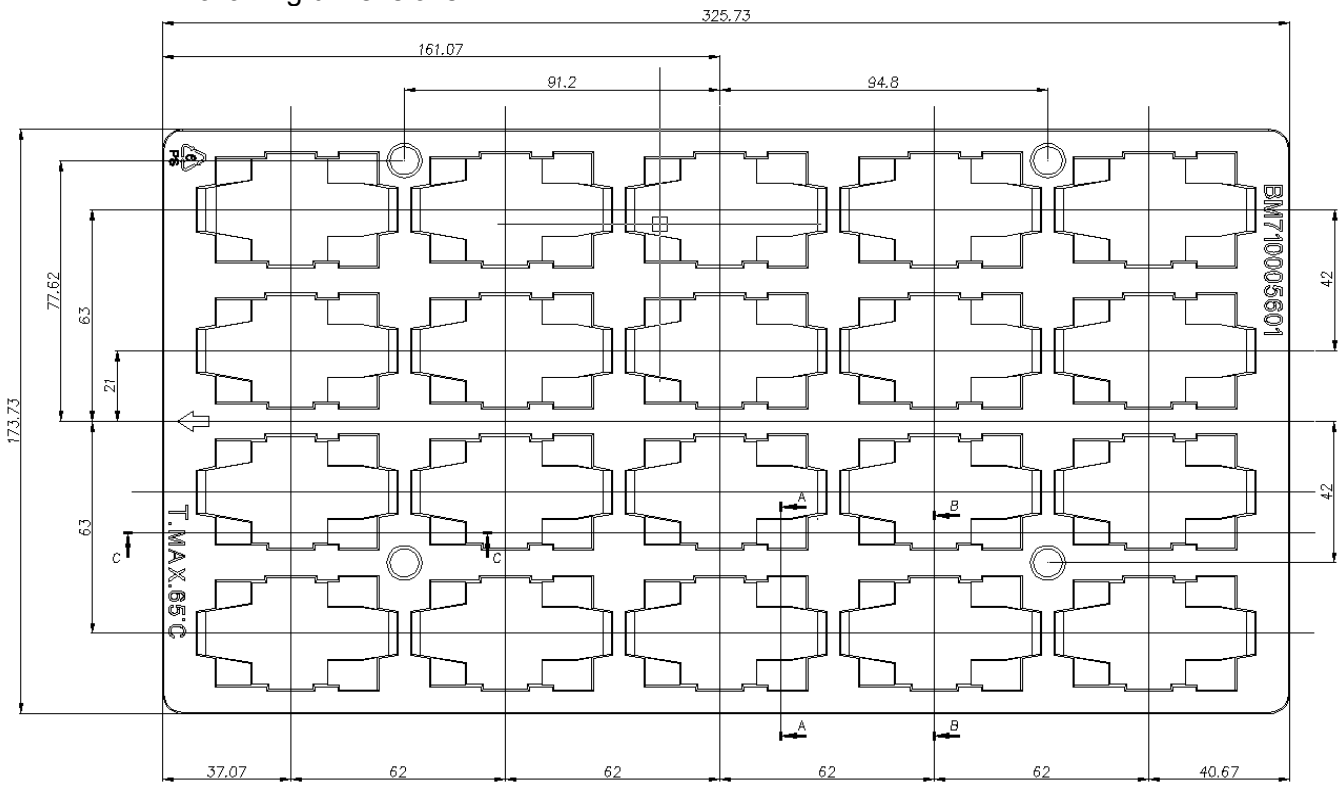


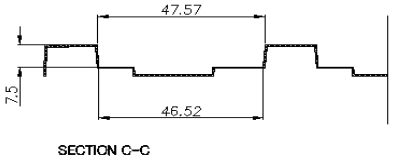
NOTE:

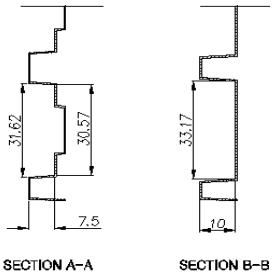
Metal tabs present on UC864-E should be connected to GND

3.17 Packing system

The Telit **UC864 family** is packaged on trays. Each tray contains 20 pieces with the following dimensions:







Size of the tray is 325.73 x 173.73mm

WARNING:

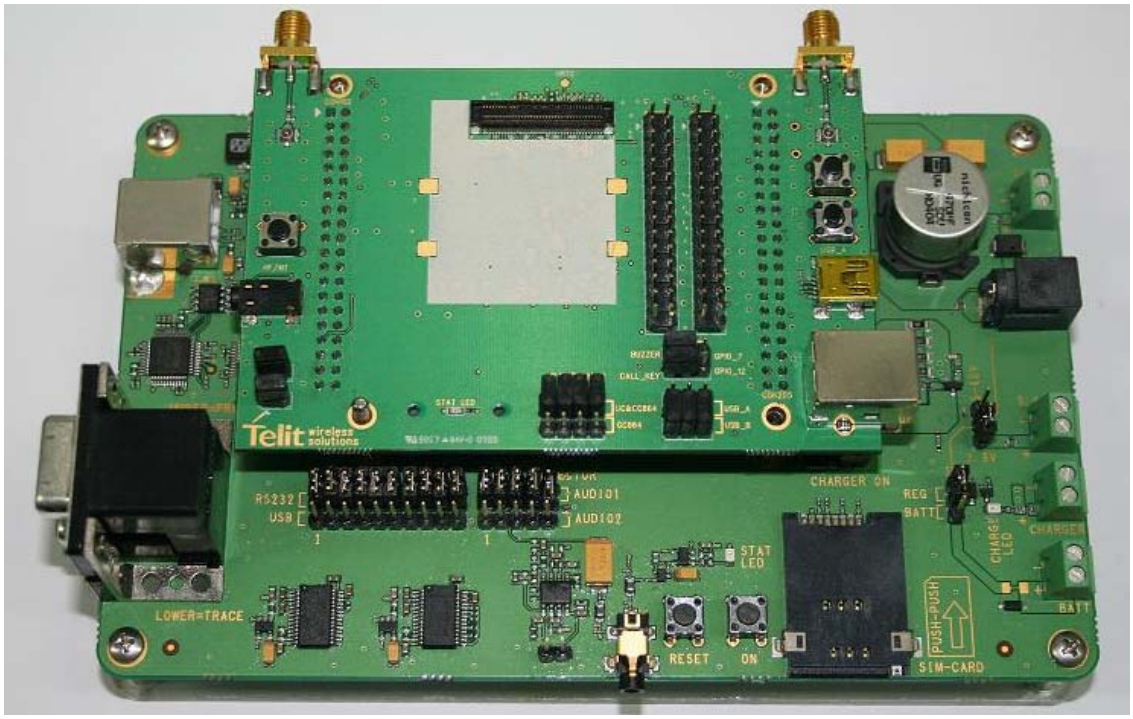
Trays can withstand the maximum temperature of 65° C.



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4 Evaluation Kit

In order to assist you in the development of your **UC864 family module** based application, Telit can supply the **EVK2 Evaluation Kit** with appropriate power supply, SIM card housing, RS 232 serial port level translator, direct UART connection, Handset, Headset and Hands-free (car kit) audio, antenna.
The **EVK2** provides a fully functional solution for a complete data/phone application.
The standard serial RS232 9 pin connector placed on the **Evaluation Kit** allows the connection of the **EVK2** system with a PC or other DTE.
The development of the applications utilizing the **Telit UC864 family module** must present a proper design of all the interfaces towards and from the module (e.g. power supply, audio paths, level translators), otherwise a decrease in the performances will be introduced or, in the worst case, a wrong design can even lead to an operating failure of the module.
In order to assist the hardware designer in his project phase, the **EVK2** board presents a series of different solutions, which will cover the most common design requirements on the market, and which can be easily integrated in the OEM design as building blocks or can be taken as starting points to develop a specific one.



Evaluation Kit



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For a detailed description of the **Telit Evaluation Kit** refer to the documentation provided with the Telit **UC864-E/G/WD/WDU** Hardware User Guide and EVK2 User Manual.



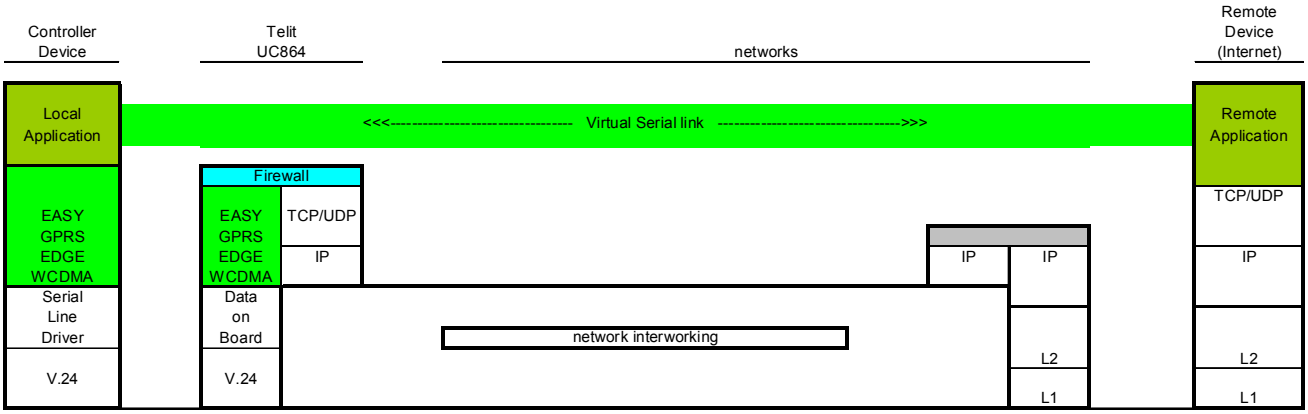
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5 Software Features

5.1 Enhanced Easy GPRS Extension

5.1.1 Overview

The Easy GPRS feature allows the **UC864 family module** user to contact a device in internet and establish with it a raw data flow over the WCDMA/EDGE/GPRS and Internet networks.
This feature can be seen as a way to obtain a "virtual" serial connection between the Application Software on the Internet machine involved and the controller of the **Telit UC864 family** module, regardless of all the software stacks underlying.
An example of the protocol stack involved in the devices is reported:



This particular implementation allows to the devices interfacing to the **Telit UC864 family** module the use of the WCDMA/EDGE/GPRS and Internet packet service without the need to have an internal TCP/IP stack since this function is embedded inside the module.



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Easy GPRS overcomes some of the known limitations of the previous implementation and implements some new features such as:

- Keep the WCDMA/EDGE/GPRS context active even after the closing of a socket, allowing the application to keep the same IP address;
- Also Mobile terminated (incoming) connections can be made, now it is possible to receive incoming TCP connection requests;
- A new internal firewall has been implemented in order to guarantee a certain level of security on internet applications.

5.1.2 Easy GPRS definition

The Easy GPRS feature provides a way to replace the need of an Internet TCP/IP stack at the terminal equipment side. The steps that will be required to obtain a virtual serial connection (that is actually a socket) to the Internet peer are:

- configuring the WCDMA/EDGE/GPRS Access
- configuring the embedded TCP/IP stack behavior
- defining the Internet Peer to be contacted
- request the WCDMA/EDGE/GPRS and socket connections to be opened (host is connected)
- exchange raw data
- close the socket and WCDMA/EDGE/GPRS context

All these steps are achieved through AT commands.
As for common modem interface, two logical statuses are involved: command mode and data traffic mode.

- In Command Mode (CM), some AT commands are provided to configure the Data Module Internet stack and to start up the data traffic.
- In data traffic mode (Socket Mode, SKTM), the client can send/receive a raw data stream which will be encapsulated in the previously configured TCP / IP packets which will be sent to the other side of the network and vice versa. Control plane of ongoing socket connection is deployed internally to the module.

For more detailed information regarding WCDMA/EDGE/GPRS please consult Easy GPRS User Guide and AT Commands Reference Guide.



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5.2 PFM (Premium FOTA Management)

Premium FOTA Management (PFM) provides a cost-effective, fast, secure and reliable way for wirelessly update the firmware on mobile devices, ensuring that embedded software is up-to-date with the latest enhancements and features.

Customers, who want to benefit from this service, must pass through the Telit certification program,where Telit will assist the customer in validating the correct implementation of FOTA.

5.2.1 FOTA (Firmware Over The Air)

Telit, which has signed a partnership agreement with the worldwide leader of Firmware OTA technology Red Bend, has integrated its unique vCurrent® Mobile client software for use in its m2m product portfolio. Telit is therefore able to upgrade its products by transmitting only a delta file, which represents the difference between one firmware version and another.

All Telit modules, starting from SW version 7.03.x00, support Over-the-Air firmware update. Note that this service will be enabled only after signing specific agreement with Telit.

See http://www.telit.com/en/infinita-services.php for details.



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6 AT Commands

The **Telit UC864 family module** can be driven via the serial interface using the standard AT commands[2].
The **Telit UC864 family modules** are compliant with:

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. 3gpp TS 27.007 specific AT command and WCDMA/GPRS specific commands.
3. 3gpp TS 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)
4. FAX Class 1 compatible commands

Moreover, the **Telit UC864 family module** supports also Telit proprietary AT commands for special purposes.
For a more information about AT commands supported by **UC864 family** modules please refer to document UC864 AT Commands Reference Guide, code 80304ST10041a.

[2] The AT is an ATTENTION command and is used as a prefix to other parameters in a string. The AT command combined with other parameters can be set up in the communications package or typed in manually as a command line instruction.



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7 Conformity Assessment Issues

The **UC864-E/G** module is assessed to the R&TTE Directive as stand-alone products, so if in the WCDMA2100/GSM900/GSM1800.
If the antenna connected to the module is installed in conformance with TELIT
Installation instructions require no further evaluation under Article 3.2 of the R&TTE Directive and do not require further involvement of a R&TTE Directive Notified Body for the final product.

In all other cases, or if the manufacturer of the final product is in doubt then the equipment integrating the radio module must be assessed against Article 3.2 of the R&TTE Directive.

In all cases assessment of the final product must be made against the Essential requirements of the R&TTE Directive Articles 3.1(a) and (b), safety and EMC respectively, and any relevant Article 3.3 requirements.

The **UC864-E/G** module is conforming to the following European Union Directives:

- R&TTE Directive 99/05/EC (Radio Equipment & Telecommunications Terminal Equipments);
- Low Voltage Directive 73/23/EEC and product safety;
- Directive 89/336/EEC for conformity for EMC.

In order to satisfy the essential requisite of the R&TTE 99/05/EC directive, the UC864-E/G module is compliant with the following standards:

- Radio Spectrum, Standard: EN 301 511, EN 301 908-1, EN 301 908-2; 3GPP 51.010-1;
- EMC (Electromagnetic Compatibility). Standards: EN 301 489-1, EN 301 489-7 and EN 301 489-24;
- LVD (Low Voltage Directive) Standards: EN 60950-1:2001+A11:2004.

In this document and the Hardware User Guide, Software User Guide all the information you may need for developing a product meeting the R&TTE Directive is included.

The Telit UC864-G modules are FCC Approved as module to be installed in other devices.
These devices have to be used only for fixed and mobile applications. If the final



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product after integration is intended for portable use, a new application and FCC ID is required.

The Telit UC864-G modules are also conforming to the following US Directives:

- Use of RF Spectrum. Standards: FCC 47 Part 22;
- Use of RF Spectrum. Standards: FCC 47 Part 24;
- EMC (Electromagnetic Compatibility). Standards: FCC47 Part 15.

To meet the FCC's RF exposure rules and regulations:

- The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter;
- The antenna(s) used for this module must not exceed 3 dBi for mobile and fixed or mobile operating configurations.

Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Manufacturers of mobile, fixed or portable devices incorporating this module are advised to clarify any regulatory questions and to have their complete product tested and approved for FCC compliance.

Interference statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.



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7.1 UC864-E: RoHS Certificate

Telit wireless solutions

DECLARATION OF EU RoHS Compliance

We,
Telit Wireless Solutions Co., Ltd.
Of:

9th Fl.,Daewoo Securities Bld.
34-3 Yeouido-dong, Yeongdeungpo-gu
Seoul 150-716
KOREA

declare under our sole responsibility that the products

UC864-E (commercial name)

4990250031 (internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Wireless Solutions Co., Ltd.
9th Fl.,Daewoo Securities Bld.
34-3 Yeouido-dong, Yeongdeungpo-gu
Seoul 150-716
KOREA

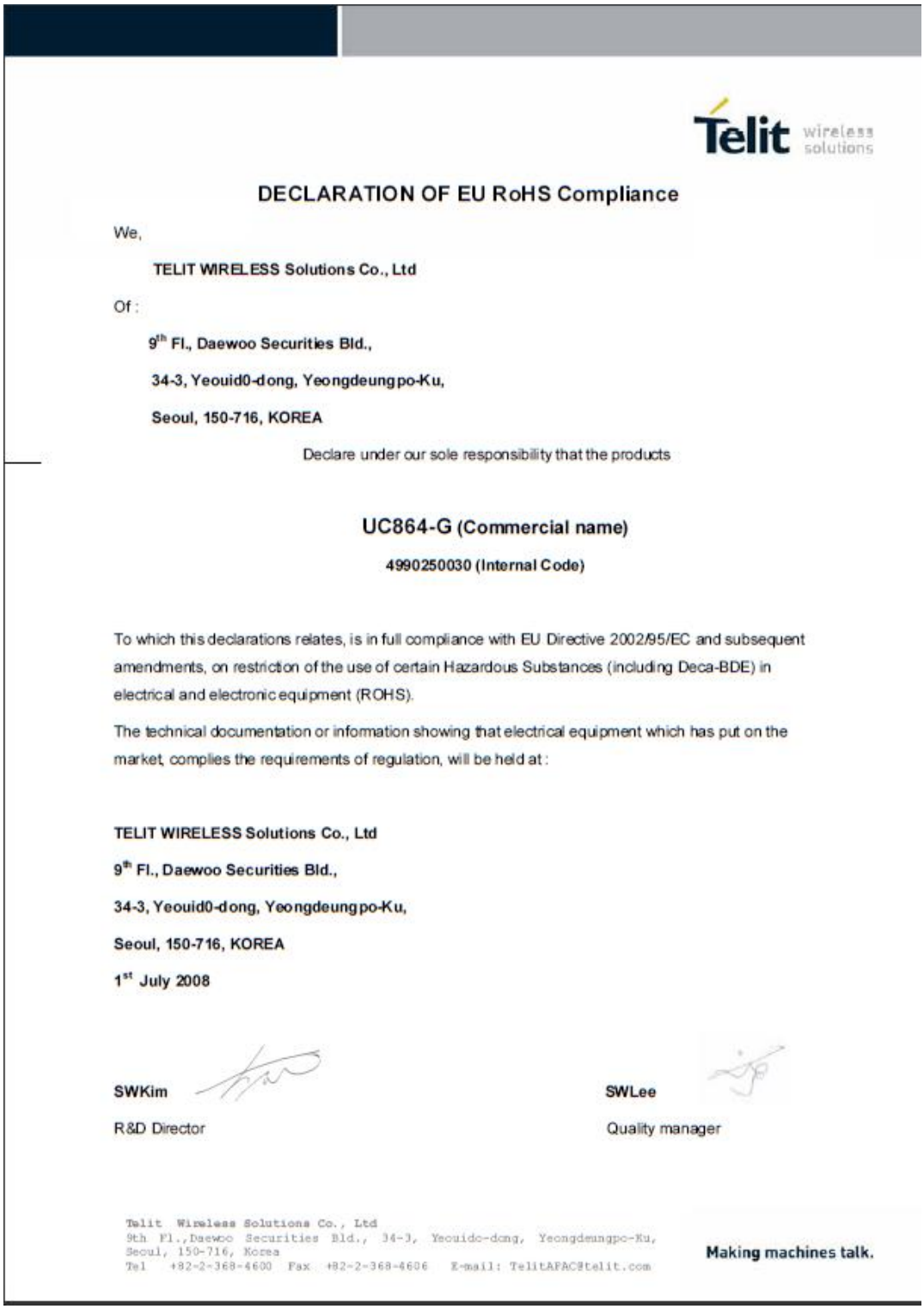
Seoul, ***12 December 2007***

R&D Director
SW Kim

Operation Senior Manager
YH Cho



7.2 UC864-G: RoHS Certificate



DECLARATION OF EU RoHS Compliance

We,

TELIT WIRELESS Solutions Co., Ltd

Of :

9th Fl., Daewoo Securities Bld.,

34-3, Yeouid0-dong, Yeongdeungpo-Ku,

Seoul, 150-716, KOREA

Declare under our sole responsibility that the products

UC864-G (Commercial name)

4990250030 (Internal Code)

To which this declarations relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances (including Deca-BDE) in electrical and electronic equipment (ROHS).

The technical documentation or information showing that electrical equipment which has put on the market, complies the requirements of regulation, will be held at :

TELIT WIRELESS Solutions Co., Ltd

9th Fl., Daewoo Securities Bld.,

34-3, Yeouid0-dong, Yeongdeungpo-Ku,

Seoul, 150-716, KOREA

1st July 2008

SWKim

R&D Director

SWLee

Quality manager

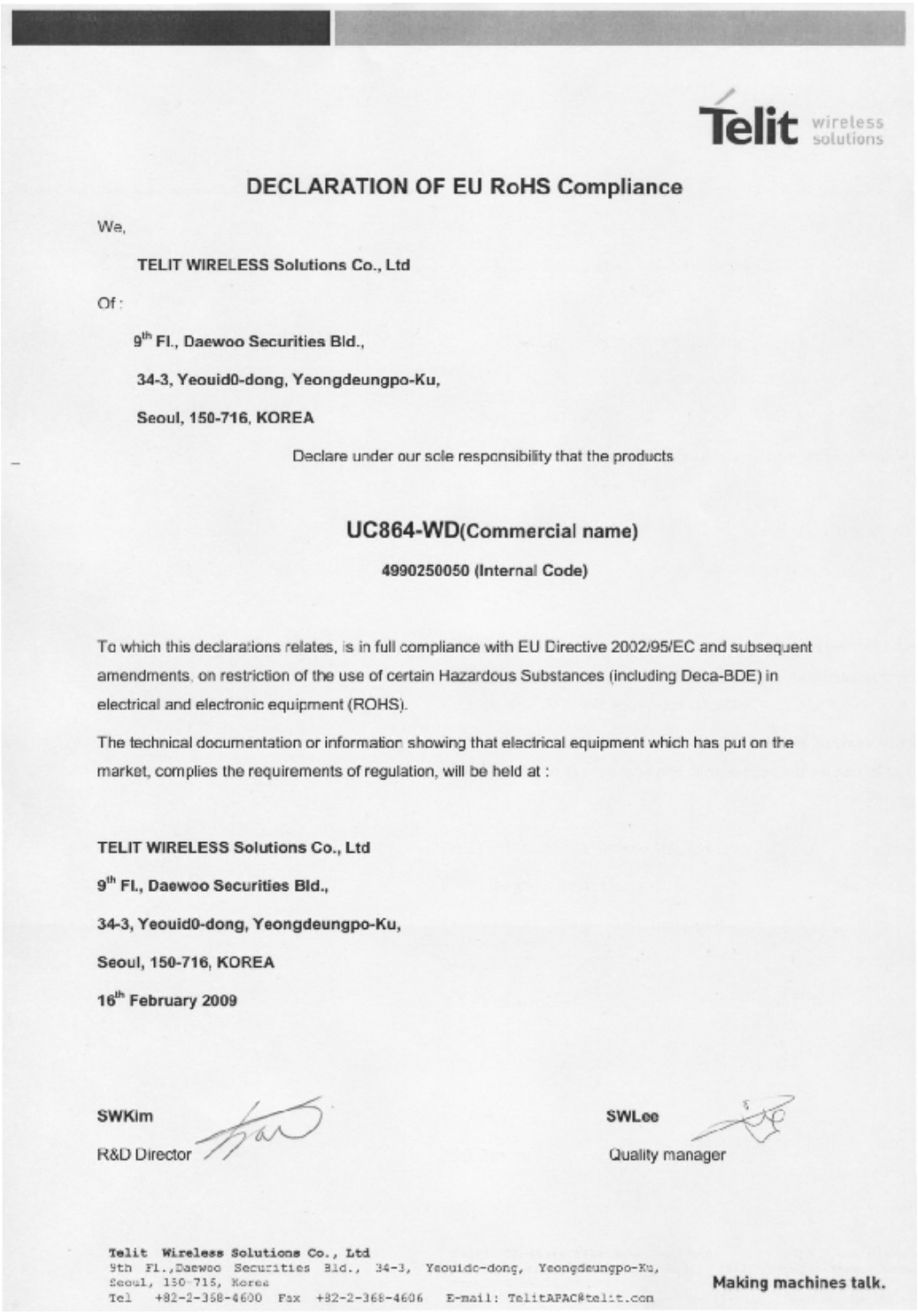
Telit Wireless Solutions Co., Ltd
9th Fl.,Daewoo Securities Bld., 34-3, Yeouido-dong, Yeongdeungpo-Ku,
Seoul, 150-716, Korea
Tel +82-2-368-4600 Fax +82-2-368-4606 E-mail: TelitAPAC@telit.com

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7.3 UC864-WD RoHS Certificate



Telit wireless solutions

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TELIT WIRELESS Solutions Co., Ltd

Of :

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34-3, Yeouid0-dong, Yeongdeungpo-Ku,

Seoul, 150-716, KOREA

Declare under our sole responsibility that the products

UC864-WD(Commercial name)

4990250050 (Internal Code)

To which this declarations relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances (including Deca-BDE) in electrical and electronic equipment (ROHS).

The technical documentation or information showing that electrical equipment which has put on the market, complies the requirements of regulation, will be held at :

TELIT WIRELESS Solutions Co., Ltd

9th Fl., Daewoo Securities Bld.,

34-3, Yeouid0-dong, Yeongdeungpo-Ku,

Seoul, 150-716, KOREA

16th February 2009

SWKim
R&D Director

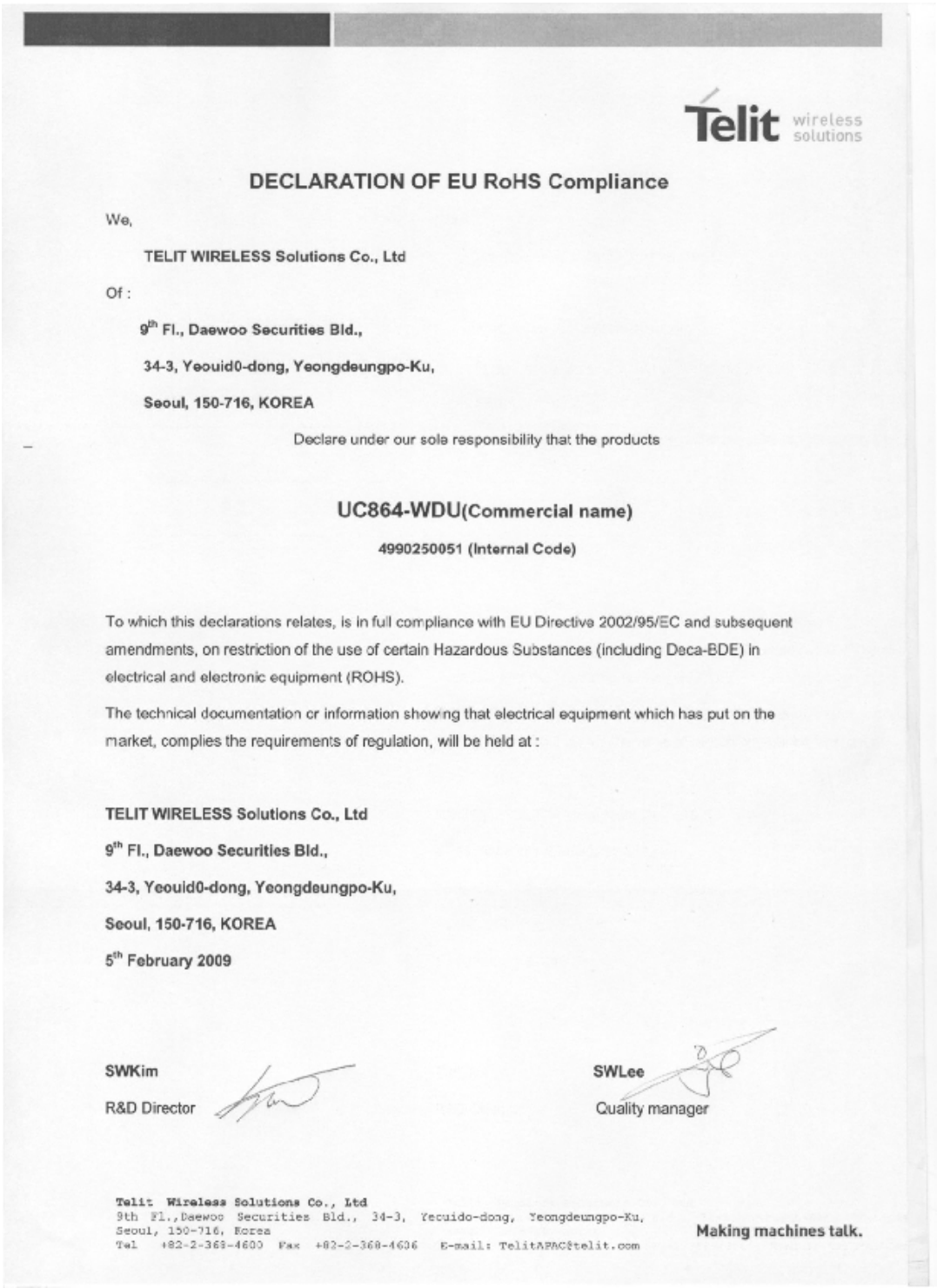
SWLee
Quality manager

Telit Wireless Solutions Co., Ltd
9th Fl.,Daewoo Securities Bld., 34-3, Yeouido-dong, Yeongdeungpo-Ku,
Seoul, 150-715, Korea
Tel +82-2-368-4600 Fax +82-2-368-4606 E-mail: TelitAPAC@telit.com

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7.4 UC864-WDU RoHS Certificate



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DECLARATION OF EU RoHS Compliance

We,

TELIT WIRELESS Solutions Co., Ltd

Of :

9th Fl., Daewoo Securities Bld.,

34-3, Yeouid0-dong, Yeongdeungpo-Ku,

Seoul, 150-716, KOREA

Declare under our sole responsibility that the products

UC864-WDU(Commercial name)

4990250051 (Internal Code)

To which this declarations relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances (including Deca-BDE) in electrical and electronic equipment (ROHS).

The technical documentation or information showing that electrical equipment which has put on the market, complies the requirements of regulation, will be held at :

TELIT WIRELESS Solutions Co., Ltd

9th Fl., Daewoo Securities Bld.,

34-3, Yeouid0-dong, Yeongdeungpo-Ku,

Seoul, 150-716, KOREA

5th February 2009

SWKim
R&D Director

SWLee
Quality manager

Telit Wireless Solutions Co., Ltd
9th Fl., Daewoo Securities Bld., 34-3, Yeouido-dong, Yeongdeungpo-Ku,
Seoul, 150-716, Korea
Tel +82-2-368-4600 Fax +82-2-368-4636 E-mail: TelitAPAC@telit.com

Making machines talk.



7.5 UC 864-E: Declaration of Conformity

DECLARATION OF CONFORMITY

We,

Telit Communications S.p.A

Of:

Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the product

UC864-E

GSM(900&1800MHz)/GPRS/EDGE/UTRA/FDD Band I /HSDPA Module

to which this declaration relates is in conformity with all the essential requirements of the European Directive 1999/05/EC (R&TTE).

The conformity with the essential requirements of the European Directive 1999/05/EC has been verified against the following harmonized standards:

RF spectrum efficiency (R&TTE art. 3.2)	EN 301 511: v9.0.02; EN 301 908-1: v2.2.1, -2:v3.2.1;
EMC (R&TTE art. 3.1b)	EN 301 489-1: v1.7.1; -7: v1.3.1, -24: v1.3.1;
Safety (R&TTE art. 3.1a)	EN 60950:2001

The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body:

CETECOM ICT Services GmbH

Untertürkheimer Straße 6-10, D-66117 Saarbrücken, Germany

Identification mark: **0682**

The technical documentation relevant to the above equipment will be held at:

Telit Wireless Solutions Co.,Ltd.
9th Floor, Daewoo Securities Bld.
34-3, Yeouido-dong, Yeongdeung-po
Seoul 150-176
Korea

Trieste, ***20 December 2007***

Quality Director
Ing. Guido Walcher

07DOC01 MOD.003 12/07 REV.10



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7.6 UC864-G: Declaration of Conformity

Telit Communications S.p.A.

DECLARATION OF CONFORMITY

We,

Telit Communications S.p.A

Of:

Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the product:

UC864-G

GSM900/1800(GPRS/EGPRS) / WCDMA2100 (HSDPA) Module

to which this declaration relates is in conformity with all the essential requirements of the European Directive 1999/05/EC (R&TTE).

The conformity with the essential requirements of the European Directive 1999/05/EC has been verified against the following harmonized standards:

RF spectrum efficiency (R&TTE art. 3.2)	EN 301 511 v9.0.2 EN 301 908-2 v.3.2.1
EMC (R&TTE art. 3.1b)	EN 301 489-7 v1.3.1 EN 301 489-24 v.1.4.1
Safety (R&TTE art. 3.1a)	EN 60950-1:2001 + A11:2004 EN50385:2002

The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body:

CCS – Compliance Certification Inc. Taiwan-Head Office No.11, Wugong 6th Rd., Wugu Township, Taipei County 24891, Taiwan

Identification mark: **0984**

The technical documentation relevant to the above equipment will be held at:

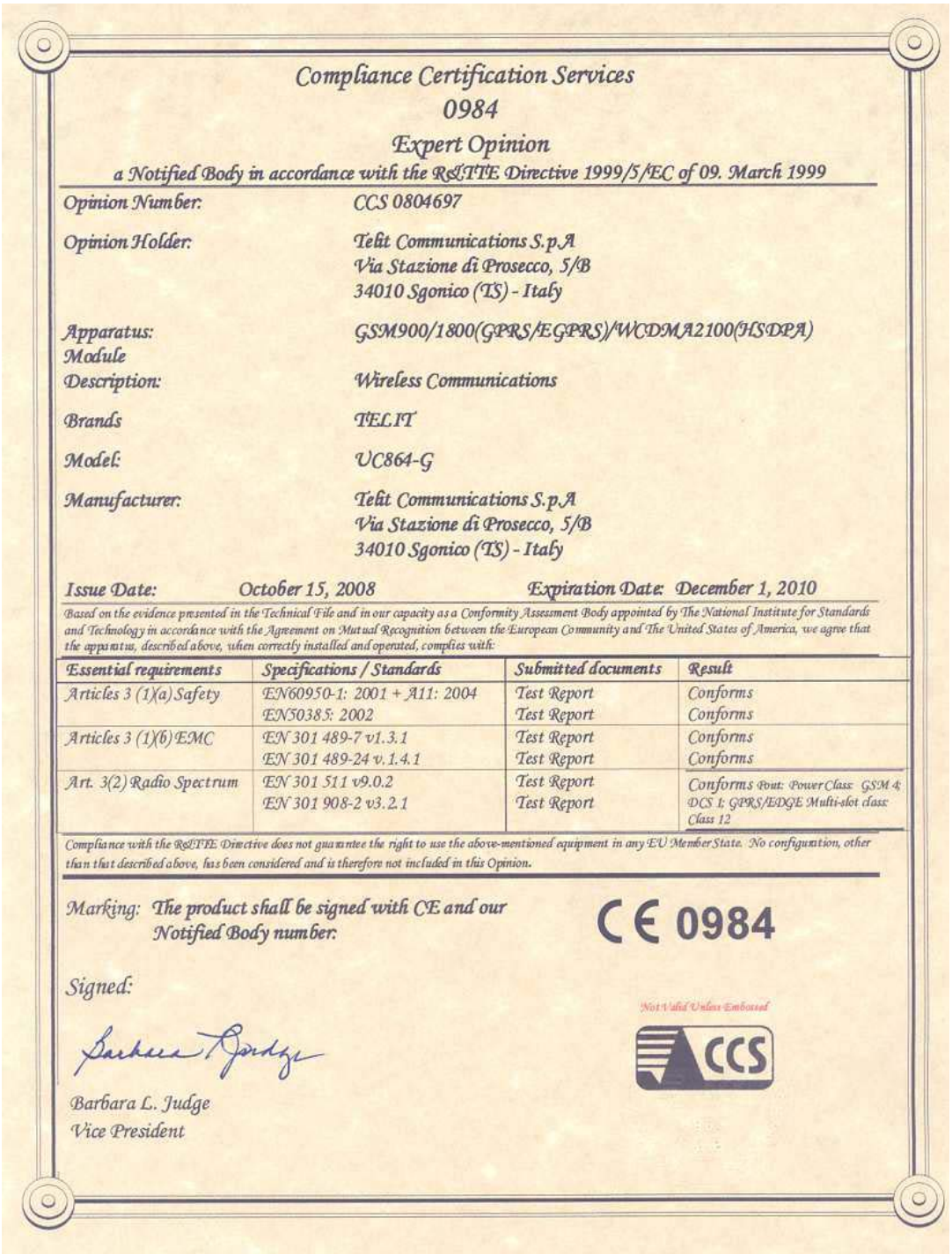
Telit Wireless Solutions Co.,Ltd.
9th Floor, Daewoo Securities Bld.
34-3, Yeouido-dong, Yeongdeung-po
Seoul 150-176
Korea

Trieste, ***16th December 2008***

VP Quality
Brian Tucker



7.7 UC864-G: R&TTE Compliance Certificate



Compliance Certification Services
0984
Expert Opinion
a Notified Body in accordance with the R&TTE Directive 1999/5/EC of 09. March 1999

Opinion Number:	CCS 0804697
Opinion Holder:	Telit Communications S.p.A Via Stazione di Prosecco, 5/B 34010 Sgonico (TS) - Italy
Apparatus: Module Description:	GSM900/1800(GPRS/EGPRS)/WCDMA2100(HSDPA) Wireless Communications
Brands	TELIT
Model:	UC864-G
Manufacturer:	Telit Communications S.p.A Via Stazione di Prosecco, 5/B 34010 Sgonico (TS) - Italy

Issue Date: October 15, 2008 Expiration Date: December 1, 2010

Based on the evidence presented in the Technical File and in our capacity as a Conformity Assessment Body appointed by The National Institute for Standards and Technology in accordance with the Agreement on Mutual Recognition between the European Community and The United States of America, we agree that the apparatus, described above, when correctly installed and operated, complies with:

Essential requirements	Specifications / Standards	Submitted documents	Result
Articles 3 (1)(a) Safety	EN60950-1: 2001 + A11: 2004 EN50385: 2002	Test Report Test Report	Conforms Conforms
Articles 3 (1)(b) EMC	EN 301 489-7 v1.3.1 EN 301 489-24 v. 1.4.1	Test Report Test Report	Conforms Conforms
Art. 3(2) Radio Spectrum	EN 301 511 v9.0.2 EN 301 908-2 v3.2.1	Test Report Test Report	Conforms Pout: Power Class: GSM 4; DCS 1; GPRS/EDGE Multi-slot class: Class 12

Compliance with the R&TTE Directive does not guarantee the right to use the above-mentioned equipment in any EU Member State. No configuration, other than that described above, has been considered and is therefore not included in this Opinion.

Marking: The product shall be signed with CE and our Notified Body number: CE 0984

Signed:

Not Valid Unless Embossed

CCS

Barbara L. Judge
Vice President



7.8 UC864-G: FCC Equipment Authorization

TCB **TCB**

GRANT OF EQUIPMENT AUTHORIZATION

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

Nemko Canada Inc.
303 River Road
Ottawa, Ontario, K1V 1H2
Canada

Date of Grant: 05/22/2008

Application Dated: 05/21/2008

Telit Communications S.p.A.
Viale Stazione di Prosecco 5/b
Trieste, 34010
Italy

Attention: Andrea Fragiacomo , Ing.

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: RI7UC864G
Name of Grantee: Telit Communications S.p.A.
Equipment Class: PCS Licensed Transmitter
Notes: GSM850/1900(GPRS/EGPRS)/UMTS850/1900 (HSDPA) Module
Modular Type: Single Modular

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	22H	826.4 - 846.6	0.211	1.0 PM	4M18F9W
	22H	824.2 - 848.8	1.633	1.0 PM	253KGXW
	22H	824.2 - 848.8	0.516	1.0 PM	245KG7W
	24E	1852.4 - 1907.6	0.19	1.0 PM	4M19F9W
	24E	1850.2 - 1909.8	0.817	1.0 PM	246KGXW
	24E	1850.2 - 1909.8	0.41	1.0 PM	246KG7W

Modular Transmitter. Power Output listed is conducted. This device is to be used only for mobile and fixed application. Approval is limited to OEM installation only. The maximum antenna gain approved for use with this device is 3dBi. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

The final product operating with this transmitter module must include operating instructions and applicable warnings for end users and installers to satisfy RF exposure compliance requirements. OEM integrators must be informed of these specific requirements. OEM integrators must ensure that the end user has no manual instructions to remove or install the UC864-G module. This device contains functions that are not operational in U.S. territories.



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7.9 UC864-G: IC Equipment Authorization

Nemko Canada Inc

CERTIFICATE OF COMPLIANCE

Nemko Canada Inc certifies that the apparatus detailed below complies with all applicable requirements of the stated specifications

Certification Number : 5131A-UC864G **Certificate Number** : 1-01654

Certificate Holder : Telit Communications S.p.A.
Via Stazione di Prosecco, 5/B 34010 Sgonico
Trieste, Italy

Model Name : UC864-G

Type of Equipment : Cellular Mobile GSM (824-849 MHz)
PCS Mobile (1850-1910 MHz)
Modular Approval

Specifications : RSS 132 Issue 2, RSS 133 Issue 3

Test Laboratory : Nemko Korea Co. Ltd.
300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu,
Yongin-City, Gyeonggi-Do, KOREA
TEL: +82 31 322 2333 FAX: +82 31 322 2332 www.nemko.com

IC OATS number : 2040E-1

Antenna Information : External Antenna with maximum antenna gain of 3 dBi

Frequency (MHz)	Output Power (Watts)	Emission Designation
826.4 - 846.6	0.211	4M18F9W
824.2 - 848.8	1.633	253KGXW
824.2 - 848.8	0.516	245KG7W
1852.4 -1907.6	0.190	4M19F9W
1850.2 -1909.8	0.817	246KGXW
1850.2-1909.8	0.410	246KG7W

Certification of equipment means only that the equipment has met the requirements of the above noted specification. Licence applications, where applicable to use certified equipment, are acted on accordingly by the issuing office and will depend on the existing radio environment, service and location of operation. This certificate is issued on condition that the holder complies and will continue to comply with the requirements and procedures issued by Industry Canada / La certification du matériel signifie seulement que le matériel a satisfait aux exigences de la norme indiquée ci-dessus. Les demandes de licences nécessaires pour l'utilisation du matériel certifié sont traitées en conséquence par le bureau de délivrance et dépendent des conditions radio ambiantes, du service et de l'emplacement d'exploitation. Le présent certificat est délivré à la condition que le titulaire satisfasse et continue de satisfaire aux exigences et aux procédures d'Industrie Canada

Date of Issue: 31 July 2008

Authorized by: **For Nemko Canada Inc**

S.C. Beck, Director of Certification

Nemko Canada Inc, 303 River Road, Ottawa, Ontario, K1V 1H2, Canada
Tel: (613) 737 9680, Fax (613) 737 9691

Cert-001 Issue 2



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7.10 UC864-G: GCF Compliance Certificate

REISSUED

Certificate of Test

Telecommunications Technology Association
Address: 267-2, Seohyeon - Dong, Bundang - Gu, Seongnam - Si, Gyeonggi - Do, 463-824, Republic of Korea
Tel: +82-70-7780-0340 Fax: +82-31-724-0249
E-mail: hcmoon@tta.or.kr http://www.tta.or.kr

Certificate No.:
TTA-M-08-040-01(Rev. 11)

KOLAS

1. Manufacturer(Client):

- o Name: Telit Communications S.p.A.
- o Address: Via Stazione di Prosecco 5/B 34010 Sgonico (TS) – Italy
- o Telephone: +82-2-368-4661

2. EUT(Equipment Under Test): GSM/GPRS/EGPRS/UMTS Terminal Equipment (Type Name: **UC864-G**)

Hardware Version	Software Version
1.0	08.01.105

3. Applicable Scopes:

GCF-CC v3.30.1
NAPRD.03 v3.14.0
EN 301 511 v9.0.2
EN 301 908-2 v3.2.1

4. Date of Test:

o Date of first test : March 24, 2008 o Date of last test : September 26, 2008

5. Test Method Used: All the tests were performed according to the test specifications which are listed in section 3.2 of the attached test report, of which Report No. is TTA-M-08-040-TR11.

6. Test Results: TTA verifies that all the relevant tests as listed in section 3 of the attached test report, of which Report No. is TTA-M-08-040-TR11, have been performed with the tested GSM/UMTS terminal equipment type.

Official Observer of GCF

CTIA Authorized Test Lab
LAB CODE 20040322-00

Prepared By:		Approved By:	
Mr. Hyunwook Ryu	Ryu	Mr. Jason Moon	MOON
(Test Consultant)	(Signature)	(Technical Manager)	(Signature)

The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

October 6, 2008

President
Telecommunications Technology Association

TPG-0024-1(00) Page(1) / (399)Pages



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8 SAFETY RECOMMENDATIONS

READ CAREFULLY

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc
- Where there is risk of explosion such as gasoline stations, oil refineries, etc

It is responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity.

We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations.

The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible of the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as of any project or installation issue, because the risk of disturbing the WCDMA/GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force.

Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case of this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.



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The European Community provides some Directives for the electronic equipments introduced on the market. All the relevant information's are available on the European Community website:

http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm

The text of the Directive 99/05 regarding telecommunication equipments is available, while the applicable Directives (Low Voltage and EMC) are available at:

http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm



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9 List of acronyms

ACM	Accumulated Call Meter
ASCII	American Standard Code for Information Interchange
AT	Attention commands
CB	Cell Broadcast
CBS	Cell Broadcasting Service
CCM	Call Control Meter
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CMOS	Complementary Metal-Oxide Semiconductor
CR	Carriage Return
CSD	Circuit Switched Data
CTS	Clear To Send
DAI	Digital Audio Interface
DCD	Data Carrier Detected
DCE	Data Communications Equipment
DRX	Data Receive
DSR	Data Set Ready
DTA	Data Terminal Adaptor
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Equipment Institute
FOTA	Firmware Over The Air
FTA	Full Type Approval (ETSI)
GPRS	General Radio Packet Service
GPS	Global Positioning System
GSM	Global System for Mobile communication
HF	Hands Free
HSDPA	High Speed Downlink Packet Access
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IRA	International Reference Alphabet
ITU	International Telecommunications Union
IWF	Inter-Working Function
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LF	Linefeed
ME	Mobile Equipment



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MMI	Man Machine Interface
MO	Mobile Originated
MS	Mobile Station
MT	Mobile Terminated
OEM	Other Equipment Manufacturer
PB	Phone Book
PFM	Premium FOTA Management
PDU	Protocol Data Unit
PH	Packet Handler
PIN	Personal Identity Number
PLMN	Public Land Mobile Network
PUCT	Price per Unit Currency Table
PUK	PIN Unblocking Code
RACH	Random Access Channel
RLP	Radio Link Protocol
RMS	Root Mean Square
RTS	Ready To Send
RI	Ring Indicator
SCA	Service Center Address
SIM	Subscriber Identity Module
SMD	Surface Mounted Device
SMS	Short Message Service
SMSC	Short Message Service Center
SS	Supplementary Service
TIA	Telecommunications Industry Association
UDUB	User Determined User Busy
UMTS	Universal Mobile Telecommunications System
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data
WCDMA	Wideband Code Division Multiple Access
WEDGE	Wideband Enhanced Data for GSM Evolution
3gpp	3rd Generation Partnership Project



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